**REMARKS**

In accordance with the foregoing, pending claims 1-3 and 15 are canceled, claims 4-6, 14, 16 and 17 are amended, and new claims 18-21 are presented.

No new matter is presented, and approval and entry of the amended and new claims is respectfully requested.

As set forth below, it is submitted that the claims as now presented herein clearly, patentably distinguish over the art and rejections of record.

**THE FINAL REJECTION OF JUNE 3, 2003**

Rejection of Claims 1-6 For Obviousness Under 35 USC § 103(a) Over Akram et al. in View of Itabashi et al.

**AKRAM ET AL.**

It is respectfully submitted that the Examiner misinterprets the elements of Akram et al. in setting forth grounds in support of the rejections of claims 1-6 at page 2-3 of the Action.

Akram illustrates, in Figs. 1-4, a stacked arrangement of individual packages 10, each configured as seen in Figs. 1-3 and which are shown in Fig. 4 as an assembly 48 of identical stacked elements 10A, 10B and 10C. It should be apparent from Fig. 4 that the structure of Akram is incapable of achieving the integration and high level of functionality of the semiconductor device of the invention, since the stacked components elements 10A, 10B and 10C are not formed in succession, one upon the other; instead, they are formed individually, each as a separate package 10, and then merely are mechanically stacked and thereby electrically interconnected by sets of mating, aligned contacts 38 and 32. Thereafter, bonded connections are formed by, e.g., reflowing the second contacts 38A, 38B, 38C, formed of solder, onto the first contacts 36B, 36C and 52, formed of a solder wettable material (col. 5, lines 18-21) or by compressive bonding or yet other techniques (col. 5, lines 22-30).

Neither the structure of the individual package 10 (see Fig. 1) nor of the stacked packages 10A, 10B, 10C... (see Fig. 4) conforms to that specified by the pending claims.

Particularly, while the Examiner cites elements 44 and 46 of Akram as constituting "an

insulating layer", in fact, they are not. Element 44 is a die encapsulent and element 46 is a wire encapsulent. As shown in Fig. 1, the die encapsulent 44 surrounds a die 14 received on, and within, a die mounting cavity 16 recessed into the substrate 12 from an upper surface (i.e., as seen in Fig. 1) of the substrate 12. By contrast, the wiring encapsulent 46 is received within a wire bonding cavity 18 recessed into, and extending upwardly from a bottom surface of, the substrate 12. Hence, there is no basis to construe these separate encapsulents 44 and 46, as constituting a single insulating layer recited in the pending claims.

Moreover, the Examiner's reading of the language of claim 1 on the structure of Akram is altogether flawed, since failing to acknowledge that Akram requires a substrate 12 having the upper die mounting cavity 16 and the lower wire bonding cavity 18 in which the die 14 and the wires 22, respectively, are first received and in which, subsequently, the respective encapsulents 44 and 46 are then deposited.

Applicants further submit that the Examiner's reading of the recitations of claim 1 on Akram is faulty, due to the somewhat awkward recitation in claim 1, as pending at the time of the present Office Action, of "plural pairs of conductive layers 26...." Particularly, the intent was to recite that each conductor layer (such as any of 22, 24 and 26 in Fig. 2) and each insulating layer (such as any of 23, 25, and 27), respectively associated therewith, form a "pair", thus yielding, in the Fig. 2 disclosed structure, three pairs of layers, i.e., the pair 22 and 23, the pair 24 and 25, and the pair 26 and 27. Thus, the Examiner's reading in the paragraph at the top of page 3 of the Action of "the wiring pattern of each pair of conductor layers..." is incorrect since, instead, each individual conductor layer, such as the conductor layer 22, comprises a wiring pattern--i.e., the conductor layer and the wiring pattern thereof are one and the same. Instead, a "pair" constitutes an insulating layer and a wiring pattern (i.e., conductive layer). Thus, there is no "wiring pattern" corresponding to "a pair of conductor layers...." (Emphasis added.)

New claim 18, substituted for claim 1, now canceled, in accordance with the foregoing, is free of any recitation of the "pair" as appeared in claim 1 and is submitted to patentably distinguish, as later discussed.

Finally, in the second paragraph at page 3 of the Action, the Examiner misinterprets Akram col. 5, lines 3-7. The reference merely says that rather than the three packages 10A, 10B and 10C shown in Fig. 4:

> ...[T]he assembly can include more than three packages but at least two packages. Each chip scale package 10A, 10B, 10C can

be substantially identical in construction....

(Col. 5, lines 4-6) Thus, there is no teaching in the reference of two or more semiconductor elements in a single package. Note also that the wire encapsulent 46 does not embed any semiconductor element therewithin.

**ITABASHI ET AL.**

Itabashi et al. is relied upon solely for disclosing flip chip mounting--which applicants do not contend is novel or patentable, per se. However, the Action never asserts any ground of rejection based on a combination of Itabashi et al. with Akram et al.

Instead, the Examiner contends for the obviousness of combining:

> ...[T]he teaching of Itabashi with the method of Kim in order to provide excellent anti-shock resistance and connection reliability (col. 3, lines 35-45; emphasis added)

However, Kim is not relied upon in the present Action--*viz.*, the rejection of claims 1-6 set forth at page 2 of the Action, as above noted, is for obviousness over Akram et al. in view of Itabashi et al. Hence, the reliance on the combination of Kim with Itabashi et al. is without basis and the rejection should be withdrawn. It is noted that Kim et al. was last relied upon, in this prosecution, in the Action mailed June 18, 2002 and claim rejections based thereon were traversed in the following response. Kim was no longer relied upon in the following Office Action of December 19, 2002. Accordingly, it is respectfully submitted that Kim has been distinguished and it is no longer of relevance in this prosecution.

The citation at page 3 in the penultimate paragraph, asserting "Itabashi discloses in Figs. 1-11..." cites Fig. 10 and Col. 17, lines 10-30 of that reference--which do relate to flip chip mounting using solder balls 38 to mount the structure of Fig. 9 to a large scale printed wiring board 41, following which a "gap between the...board 41 and the semiconductor device is filled with an under filler made of epoxy resin after bonding them with the solder balls 38...." (Col. 17, lines 20-24) [The under filler is identified as "39" in Fig. 10, although the specification does not employ the identifying numeral "39."]

It is doubly clear that the "under filler made of epoxy resin..." employed in Fig. 10 of Itabashi is not an "anisotropically conductive film..." and thus would not serve to electrically

connect the elements as recited in claims 5 and 6--contrary to the Examiner's stated ground of rejection. Accordingly, it is submitted that the rejection of claims 4-6 is fatally defective and should be withdrawn.

Whether Kim or Itabashi is being relied upon, and since reliance thereon is solely for flip chip mounting, it is clear that the secondary reference is incapable of overcoming the deficiencies of Akram and, according, claims 4-6 along with claim 18 should be deemed allowable.

**CONCLUSION**

Accordingly, in accordance with the foregoing, independent claims 14, 17 and 18 patentably distinguish over Akram taken singly or in any proper combination with the references of record; further, the dependent claims 15-16 and 4-6 inherit those patentably distinguishing features of claims 14 and 18, respectively, and likewise patentably distinguish over the Akram taken singly or in any combination with any of the references of record. Thus, all of the pending claims herein are submitted to be allowable.

**REJECTION OF CLAIMS 14-17 FOR ANTICIPATION UNDER 35 USC § 102(e) BY AKRAM ET AL. AT PAGES 4-5 OF THE ACTION; AND**

**RESPONSE TO AMENDMENT AT PAGES 5-6 OF THE ACTION**

Each of these portions of the action repeats the incorrect contentions that Akram discloses a first insulating layer (44, 46)--which has been shown hereinabove to be inaccurate; moreover, Akram clearly does not support the further recitations, in each of claims 14 and 17, of at least one semiconductor element and a conductive layer (comprising a wiring pattern) embedded within each insulating layer. Akram teaches only the provision of wires 22 received in cavity 18 and embedded in the wire encapsulent 46 and a die 14 received in a cavity 16 and surrounded, around its edges, --but not embedded-- by the die encapsulent 44. Clearly, Akram does not "embed" the die 14 which, instead, is fully exposed at its upper surface at the top of the package 10 (see Fig. 1). Moreover, and as before noted, the Akram structure requires the existence of a substrate 12 in which the cavities 16 and 18 are pre-formed, and into which the separate encapsulents 44 and 46 are inserted.

Further, claim 17 as amended recites the first and second insulating members as being

"formed on the first (and second, respectively) sets of conductors"--which is not the teaching of Akram. Instead, in Akram, the middle package 10B is spaced from both the upper package 10A and the lower package 10C, the spacing or separation being produced by the connectors/solder balls 38A and the raised terminals 36B and 36C--producing respective gaps between the stacked elements.

Likewise, contrary to the Examiner's contentions in the first full paragraph at page 5 of the Office Action, purporting to read the "second insulating layer..." paragraph of claim 17 on Akram, the Examiner does not identify any element of Akram as allegedly corresponding to the recited "second insulating layer...provided on the first insulating layer and containing therein the second conductive layer...."

The Examiner's "response to arguments" is likewise deficient for the same or similar reasons.

**CONCLUSION**

While Itabashi et al. is cited in the initial statement at page 2 of the Office Action of the rejection of claims 1-6, no grounds of rejection based on Itabashi in combination with Akram are set forth and, accordingly, the rejection is fatally defective and should be withdrawn.

Moreover, it has been shown that the anticipation rejection of claims 14-17 is flawed since Akram discloses an altogether different structure than that to which the instant invention and the pending claims are directed.

New claims 18-21, presented hereinabove, as well as claims 14-17, as amended herein, clearly patentably distinguish over Akram by reciting plural device layers stacked, in succession, on the main surface of a substrate, each device layer comprising a conductor layer comprising a wiring pattern, a semiconductor element electrically connected to the wiring pattern and a single insulating layer respectively associated with and embedding therein the semiconductor element and the associated conducting layer (wiring pattern). Moreover, the wiring pattern is recited as being formed on and extending through vias in a first, single insulating layer and embedded in a second, single insulating layer such that the respective wiring patterns of plural stacked layers are selectively electrically interconnected through the corresponding vias.

The pending claims, as amended and/or newly presented herein, are respectfully submitted to distinguish patentably over the art of record, namely, Akram--whether taken

singularly or in any proper combination with whichever secondary reference of record the Examiner may choose to rely upon.

There being no other objections or rejections, it is submitted that the application is in condition for allowance, which action is earnestly solicited.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: November 3, 2003

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